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EXAMINER

CARTER, AARON W

ART UNIT	PAPER NUMBER
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2625

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/005,643

Applicant(s)

BENKLEY, FRED G.

Examiner

Aaron W. Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-19,35,37-69 and 71-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19,35,37-69 and 71-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ✓ ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/25/05.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This action is responsive to papers filed on February 25, 2005.

#### ***Response to Amendment***

2. In response to applicant's amendment received on February 25, 2005, all requested changes to the claims have been entered.

#### ***Response to Arguments***

3. Applicant's arguments, see Remarks, pages 14-18, filed February 25, 2005, with respect to the rejection(s) of claim(s) 84 under 35 USC 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of US Patent Application Publication 2004/0012773 to Puttkammer.

4. Applicant's arguments with respect to claims 1, 35, 67, 73, 79 and 82 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claims 79-81 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 79 recites the limitation "said rate sensor" in line 7. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 5, 6, 12-19, 69, 73 and 77 are rejected under 35 U.S.C. 102(e) as being anticipated by of US Patent Application Publication 2004/0012773 to Puttkammer.

As to claim 1, Puttkammer discloses an image sensing apparatus comprising:

An image pickup plate disposed generally laterally with respect to a direction of movement of an object (Fig. 1, element 10, paragraph 0040, lines 14-16 and paragraph 0043, lines 2-5, wherein the one receiving electrode corresponds to an image pickup plate); and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps between respective image drive plates and said image pickup plate (Fig.

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1, elements 9, paragraph 0040, lines 14-16 and paragraph 0043, lines 5-9), wherein features of the object passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plate (paragraph 0041 and paragraph 0043, lines 9-17).

As to claim 5, Puttkammer discloses the image sensing apparatus as defined in claim, wherein said image drive plates comprise parallel conductors disposed perpendicular to said image pickup plate and spaced from said image pickup plate by respective sensor gaps (Fig. 1, element 9 and 10, wherein elements 9 corresponds to the image drive plates and element 10 corresponds to the image pickup plate).

As to claim 6, Puttkammer discloses the image sensing apparatus as defined in claim 1, wherein said image pickup plate comprises two or more image pickup plates disposed generally laterally with respect to the direction of movement of the object (Fig. 5 and paragraph 0046).

As to claim 12, Puttkammer discloses the image sensing apparatus as defined in claim 1, further comprising:

An excitation circuit for sequentially energizing said image drive plates with drive signals (paragraph 0043, lines 20-22), and

A detection circuit for detecting the drive signals capacitively coupled from said image drive plates to said image pickup plate to provide image signals (paragraph 0041).

As to claim 13, Puttkammer discloses the image sensing apparatus as defined in claim 12, wherein said drive signals comprises sequential signal bursts applied to respective one of said image drive plates (paragraph 0043, lines 20-22).

As to claim 14, Puttkammer discloses the image sensing apparatus as defined in claim 13, wherein the excitation circuit includes for coupling non-energized drive plates to a reference potential (paragraphs 0041 and 0043, lines 20-22, wherein it is inherent that the non-energized drive plates are coupled to a reference potential).

As to claim 15, Puttkammer discloses the image sensing apparatus as defined in claim 13, wherein said signal bursts comprise bursts of a clock signal (paragraph 0041, wherein oscillator corresponds to burst of a clock signal).

As to claim 16, Puttkammer discloses the image sensing apparatus as defined in claim 13, wherein said detection circuit comprises a synchronous detector for providing pulses in response to the detected signal bursts (paragraph 0042).

As to claim 17, Puttkammer discloses the image sensing apparatus as defined in claim 16, further comprising an A/D converter for converting said pulses to digital values, a memory and a processor for storing the digital values in said memory (paragraph 0042).

As to claim 18, Puttkammer discloses the image sensing apparatus as defined in claim 17, wherein said processor initiates a plurality of sequential line scans of said image drive plates to provide a plurality of line scans along lines of the moving object (paragraph 0043, lines 19-21).

As to claim 19, Puttkammer discloses the image sensing apparatus as defined in claim 12, wherein said detection circuit includes an amplifier for receiving the capacitively coupled drive signals, said amplifier having a gain that is an inverse function of the amplitude of the capacitively coupled drive signals (paragraph 0042 and 0045).

As to claim 69, Puttkammer discloses the image sensing apparatus as defined in claim 1, wherein said image pickup plate and said plurality of image drive plates are substantially coplanar (Puttkammer, Fig. 3).

As to claim 73, please refer to rejections made for claims 1 and 69 above.

As to claim 77, Puttkammer discloses a capacitive sensor as defined in claim 73, wherein said array of sensor gaps comprises a linear array (Fig. 3).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2-4, 7-9, 67, 74, 76, 78, 82-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puttkammer in view of USPN 6,643,389 to Raynal et al. ("Raynal") (already of record).

As to claim 2, Puttkammer discloses an image sensing apparatus as defined in claim 1.

Puttkammer does not disclose expressly wherein said plurality of image drive plates are dimensioned and spaced for sensing ..

Raynal discloses an image sensing apparatus comprising:

image pickup plates disposed generally laterally with respect to a direction of movement of an object (Fig. 1, 2 and 3 and column 4, lines 58-67, wherein the sensor array, element 13, comprises multiple cells each containing a first and second capacitor one of which corresponds to the image pickup plate and the other corresponds to the image drive plate); and

A plurality of image drive plates in spaced relation to said image pickup plates to define a plurality of sensor gaps, wherein features of the object passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plate (column 4, lines 60-67 and Fig. 3, elements 35 and 37).

wherein said at least one image pickup plate and said plurality of image drive plates are dimensioned and spaced for sensing a fingerprint (column 3, lines 31-37).

Puttkammer & Raynal are combinable because they are from the same art of image sensing through the use of image pickup and drive plates used to determine a change in capacitance.

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At the time of the invention, it would have been obvious to a person of ordinary skill in the art to space and dimension the image pick plate and the image drive plates as disclosed by Puttkammer for sensing a fingerprint as taught by Raynal.

The suggestion/motivation for doing so would have been to provide a less expensive device that is less subject to spoofing for fingerprint recognition (Raynal, column 1, lines 13-19 and 49-60 and column 2, lines 59-62).

Therefore, it would have been obvious to combine Puttkammer with Raynal to obtain the invention as specified in claim 2.

As to claim 3, the combination of Puttkammer and Raynal discloses the image sensing apparatus as defined in claim 2, wherein a spacing between each of said image drive plates and said image pickup plates is less than about one half of the ridge spacing on a typical fingerprint (Raynal, column 3, lines 65-67, wherein if each cell is smaller than the width of a ridge and each cell contains an image drive and pickup plate spaced apart then it is inherent that the distance between them in "less than about half of the ridge spacing" on a typical fingerprint).

As to claim 4, the combination of Puttkammer and Raynal discloses the image sensing apparatus as defined in claim 2, wherein a spacing between each of said image drive plates and said image pickup plate is less than about one half of the ridge spacing on a typical fingerprint (Raynal, column 3, lines 61-67).

As to claim 7, the combination of Puttkammer and Raynal discloses the image sensing apparatus as defined in claim 2, including at least about 250 image drive plates (Raynal, column 3, lines 40-47).

As to claim 8, the combination of Puttkammer and Raynal discloses the image sensing apparatus as defined in claim 1, further comprising a substrate, wherein said at least one image pickup plate and said plurality of image drive plates comprise conductive traces on said substrate (Raynal, Fig. 2 and column 4, lines 40-57).

As to claim 9, the combination of Puttkammer and Raynal discloses the image sensing apparatus as defined in claim 8, wherein said substrate comprises a printed circuit board (Raynal, Fig. 2 and column 3, lines 36-37).

As to claim 67, the combination of Puttkammer and Raynal discloses a fingerprint sensing method, comprising the steps of:

Capacitively sensing ridge peaks and ridge valleys of a fingerprint (Raynal, Fig. 3) on a swiped finger with an array of capacitive sensors and providing image signals representative of a line of the fingerprint (Raynal, Fig. 1), the array of capacitive sensors comprising an image pickup plate and a plurality of image drive plates in spaced relation to the image pickup plate and a plurality of image drive plates in spaced relation to the image pickup plate to define a plurality of sensor gaps between respective image drive plates and the image pickup plate (Fig. 1, elements 9 and 10, paragraph 0040, lines 14-16 and paragraph 0043, lines 2-9, wherein the one receiving electrode corresponds to an image pickup plate); and

Acquiring from the array of capacitive sensors image signals representative of multiple lines of the fingerprint (Fig. 4) to provide a fingerprint image (column 5, lines 38-47).

As to claim 74, the combination of Puttkammer and Raynal discloses a capacitive sensor as defined in claim 73, wherein said pickup plate and said plurality of drive plates comprise conductive traces on a substrate (Raynal, column 4, lines 40-57).

As to claim 76, please refer to the rejections made for claim 2 above.

As to claim 78, the combination of Puttkammer and Raynal discloses a capacitive sensor as defined in claim 76, wherein said sensor gaps have dimensions of about 25-50 micrometers (Raynal, column 3, lines 65-67).

As to claim 82, the combination of Puttkammer and Raynal discloses a fingerprint sensing apparatus comprising:

an image sensor comprising an image pickup plate disposed generally laterally with respect to a direction of movement of a finger (Puttkammer, Fig. 1, element 10, paragraph 0040, lines 14-16 and paragraph 0043, lines 2-5, wherein the one receiving electrode corresponds to an image pickup plate and Raynal, Fig. 1) and a plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps between respective image drive plates and said image pickup plate (Fig. 1, elements 9, paragraph 0040, lines 14-16 and paragraph 0043, lines 5-9), wherein said image pickup plate and said plurality of image drive

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plates are fabricated on a substrate (Puttkammer, Fig. 3 and Raynal, column 4, lines 60-67 and Fig. 3, elements 35 and 37); and

A sensor circuit, separate from said substrate, for excitation of said image sensor with image drive signals and for detection of image signals generated by said image sensor in response to said image drive signals (Puttkammer, Fig. 2, elements 11-17).

As to claim 83, please refer to the rejections made for claim 69 above.

As to claim 84, please refer to the rejections made for claim 1 and 2 above.

As to claim 85, please refer to the rejections made for claim 77 above.

As to claim 86, please refer to the rejections made for claim 69 above.

10. Claims 35, 39, 40, 45-51, 64-68, 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,785,407 to Tschudi et al. ("Tschudi") (already of record) in view of Puttkammer.

As to claim 35, Tschudi discloses a fingerprint sensing system comprising:

An image sensor comprising an array of capacitive sensors for capacitive sensing of ridge peaks and ridge valleys of a fingerprint on a moving finger (column 2, lines 6-9 and lines 58-63), said image sensor comprising:

image sensors disposed generally laterally with respect to a direction of movement of the finger (Fig. 1a, 1b and column 2, lines 10-17); and

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wherein ridge peaks and ridge valleys of the fingerprint passing over said sensors produce a change in capacitance between respective image drive plates and said image pickup plate (column 4, lines 32-39);

a finger sensor for sensing a speed of the finger as it moves across said image sensor (column 3, lines 34-40 and column 4, lines 15-20); and

A sensor circuit for excitation of said image sensor with image drive signals and for detection of image signals in response to said image drive signals (column 2, line 65 – column 3, line 3), for excitation of said finger sensor with finger drive signals and for detection of finger signals in response to said finger drive signals (column 3, lines 34-40 and column 4, lines 15-20), and for coordinating said image signals and said rate signals to provide a fingerprint image (column 3, lines 20-28).

Tschudi does not disclose expressly an image pickup plate disposed generally laterally with respect to a direction of movement of the finger; and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps between respective image drive plates and said image pickup plate, wherein ridge peaks and ridge valleys of the fingerprint passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plate;

However, Puttkammer discloses an image sensing apparatus comprising:

An image pickup plate disposed generally laterally with respect to a direction of movement of an object (Fig. 1, element 10, paragraph 0040, lines 14-16 and paragraph 0043, lines 2-5, wherein the one receiving electrode corresponds to an image pickup plate); and

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A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps between respective image drive plates and said image pickup plate (Fig. 1, elements 9, paragraph 0040, lines 14-16 and paragraph 0043, lines 5-9), wherein features of the object passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plate (paragraph 0041 and paragraph 0043, lines 9-17).

Tschudi & Puttkammer are combinable because they are from the same art of image sensing using changes in capacitance.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to take the image sensing apparatus disclosed by Tschudi and combine with it the sensing apparatus taught by Puttkammer.

The suggestion/motivation for doing so would have been to provide a single image pickup plate with reduced capacitive coupling between electrodes (Puttkammer, paragraph 0024, lines 1-9).

Therefore, it would have been obvious to combine Tschudi with Puttkammer to obtain the invention as specified in claim 35.

As to claim 39, please refer to the rejections made for claim 5 above.

As to claim 40, please refer to the rejection made for claim 6 above.

As to claim 45, please refer to the rejection made for claim 12 above.

As to claim 46, please refer to the rejection made for claim 13 above.

As to claim 47, please refer to the rejection made for claim 14 above.

As to claim 48, please refer to the rejection made for claim 16 above.

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As to claim 49, please refer to the rejection made for claim 17 above.

As to claim 50, please refer to the rejection made for claim 18 above.

As to claim 51, please refer to the rejection made for claim 19 above.

As to claim 64, the combination of Tschudi and Puttkammer discloses a fingerprint sensing system as defined in claim 35, further comprising a substrate, wherein said image sensor and said rate sensor are fabricated on said substrate (Tschudi, column 4, lines 59-63).

As to claim 65, the combination of Tschudi and Puttkammer discloses a fingerprint sensing system as defined in claim 64, wherein said substrate comprises a flexible substrate (Tschudi, column 3, lines 49-58).

As to claim 66, the combination of Tschudi and Puttkammer discloses a fingerprint sensing system as defined in claim 64, wherein said sensor circuit is mounted on said substrate (Tschudi, column 4, lines 59-63).

As to claims 67 and 68, please refer to rejections made for claim 35 above.

As to claim 71, please refer to the rejections made for claim 69 above.

11. Claims 10, 11 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Puttkammer and Raynal in view of Tschudi.

As to claim 10, the combination of Puttkammer and Raynal discloses the image sensing apparatus as defined in claim 8.

The combination of Puttkammer and Raynal does not disclose expressly wherein said substrate comprises a flexible substrate.

Tschudi discloses a an image sensing apparatus comprising a flexible substrate (column 3, lines 49-58 and column 4, lines 5-14).

Puttkammer, Raynal & Tschudi are combinable because they are from the same fields of image processing in particular fingerprint image sensing through the use of capacitance.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the image sensing apparatus disclosed by the combination of Puttkammer and Raynal with the image sensing substrate as taught by Tschudi.

The suggestion/motivation for doing so would have been that the flexible substrate provides measurements of a larger area of the finger print surface than linear or flat devices (Tschudi, column 3, lines 52-54).

Therefore, it would have been obvious to combine Puttkammer, Raynal with Tschudi to obtain the invention as specified in claim 10.

As to claim 11, the combination of Puttkammer, Raynal and Tschudi discloses the image sensing apparatus as defined in claim 10, further comprising a substrate support, wherein said flexible substrate is affixed to said substrate support and wherein said substrate support has a contour selected to substantially match the contour of a typical finger (Tschudi, column 3, lines 49-58 and column 4, lines 5-14).

As to claim 75, please refer to the rejections made for claim 10 above.

12. Claims 37, 38, 41-44, 52-63 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tschudi and Puttkammer in view of Raynal.

As to claim 37, the combination of Tschudi and Puttkammer discloses the fingerprint sensing system as defined in claim 35.

The combination of Tschudi and Puttkammer does not disclose expressly wherein a spacing between each of said image drive plates and said image pickup plate is less than about one half of the ridge spacing on a typical fingerprint.

However, Raynal discloses a fingerprint sensing system comprising image pickup plates and image drive plates, wherein a spacing between each of said image drive plates and said image pickup plate is less than about one half of the ridge spacing on a typical fingerprint (column 3, lines 65-67, wherein if each cell is smaller than the width of a ridge and each cell contains an image drive and pickup plate spaced apart then it is inherent that the distance between them in "less than about half of the ridge spacing" on a typical fingerprint).

Tschudi, Puttkammer & Raynal are combinable because they are from the same art of image sensing through the use of capacitance.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to take the fingerprint sensing system disclosed by Tschudi and Puttkammer and space the

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image drive and pickup plate less than about one half of the ridge spacing on a typical fingerprint as taught by Raynal.

The suggestion/motivation for doing so would have been to provide sufficient over-sampling to reconstruct an accurate fingerprint image (Raynal, column 2, lines 50-58).

Therefore, it would have been obvious to combine Tschudi and Puttkammer with Raynal to obtain the invention as specified in claim 37.

As to claim 38, please refer to the rejection made for claim 4 above.

As to claim 41, please refer to the rejection made for claim 7 above.

As to claim 42, please refer to the rejection made for claim 8 above.

As to claim 43, please refer to the rejection made for claim 10 above.

As to claim 44, please refer to the rejection made for claim 11 above.

As to claim 52, the combination of Tschudi, Puttkammer and Raynal disclose a fingerprint sensing system as defined in claim 35, while Tschudi discloses a rate sensor comprising two or more finger detectors spaced apart along a direction of movement of the finger used to detect a change in capacitance (column 2, line 65 – column 3, line 3, column 3, lines 35-40 and 4, lines 15-20), however does not give the specific details of how the change in capacitance is determined. Raynal further discloses two or more detectors (Fig. 2, elements 21) including at least one drive plate and at least one pickup plate (Fig. 3, elements 35 and 37), wherein an end of a finger passing over each of said finger detectors produces a change in capacitance between the drive plates and pickup plates (column 5, lines 10-14).

As to claim 53, please refer to the rejections made for claim 1 above.

As to claim 54, the combination of Tschudi, Puttkammer and Raynal disclose a fingerprint sensing system as defined in claim 52, Raynal further discloses wherein the rate pickup plates of the finger detector are commonly connected (Fig. 2 and 3, wherein each cell contains a pickup plate and each cell is connected).

As to claim 55, the combination of Tschudi, Puttkammer and Raynal discloses a fingerprint sensing system as defined in claim 52, Raynal further discloses wherein each of said finger detectors includes first and second rate pickup plates disposed on opposite sides of the rate drive plate to form a differential capacitive sensor (Fig. 2 and 3, wherein each cell contains a pickup plate and the cells in rows and columns meaning that the pickup plates are disposed on opposites of the drive plates).

As to claim 56, please refer to the rejections made for claim 54 above.

As to claim 57, the combination of Tschudi, Puttkammer and Raynal discloses a fingerprint sensing system as defined in claim 52, Tschudi further discloses wherein the rate drive plates and the rate pickup plates of said finger detectors are curved to substantially match the curve of a typical finger end (column 3, lines 49-58).

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As to claim 58, please refer to the rejections made for claim 8 above.

As to claim 59, please refer to the rejections made for claim 8 and 10 above.

As to claim 60, please refer to the rejections made for claim 12 above.

As to claim 61, please refer to the rejections made for claim 13 above.

As to claim 62, please refer to the rejections made for claim 16 above.

As to claim 63, the combination of Tschudi, Puttkammer and Raynal disclose a fingerprint sensing system as defined in claim 60, both Tschudi and Raynal further discloses wherein said sensor circuit further comprises a processing circuit for detecting a time delay between said rate signals from said finger detectors, wherein said time delay between said rate signals is representative of the speed of the finger (Tschudi, column 3, lines 20-28 and Raynal, column 4, lines 15-21).

As to claim 72, please refer to the rejections made for claim 69 above.

13. Claims 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,333,989 to Borza in view of Tschudi.

As to claim 79, Borza discloses a fingerprint sensing system comprising:

An image sensor comprising an array of capacitive sensors for capacitive sensing of ridge peaks and ridge valleys of a fingerprint on a moving finger (Fig. 3a and column 6, lines 22-34);

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A finger sensor for sensing the movement of a finger as it moves across said image sensor, wherein said image sensor and said finger sensor are fabricated on a single substrate (Fig. 3a and column 6, lines 35-49); and

A sensor circuit, separate from said substrate, for operating said image sensor and said finger sensor to provide fingerprint data (column 7, lines 6-9).

Borza does not disclose expressly that the finger sensor detects the “speed” of the of the moving finger.

However, Tschudi discloses a finger sensor for sensing the speed of a finger as it moves across an image sensor (column 4, lines 15-20).

Borza & Tschudi are combinable because they are from they are from the same art of image sensing and motion sensing through the use capacitance detection.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to take the finger sensor for detecting movement or motion of a finger as disclosed by Borza and use the technique of find the time elapsed between detecting correlated features to determine the speed of the moving finger as taught by Tschudi.

The suggestion/motivation for doing so would have been for combining the multiple pictures of portions of the fingerprint to create a composite picture (Tschudi, column 3, line 20-28).

Therefore, it would have been obvious to combine Borza with Tschudi to obtain the invention as specified in claim 79.

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14. Claims 80 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borza and Tschudi in view of Puttkammer.

As to claim 80, the combination of Borza and Tschudi discloses the fingerprint sensing system as defined in claim 79.

The combination of Borza and Tschudi does not disclose expressly wherein the image sensor comprises:

An image pickup plate disposed generally laterally with respect to a direction of movement of the finger (Fig. 1, element 10, paragraph 0040, lines 14-16 and paragraph 0043, lines 2-5, wherein the one receiving electrode corresponds to an image pickup plate); and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps between respective image drive plates and said image pickup plate.

However, Puttkammer discloses an image sensor comprising:

An image pickup plate disposed generally laterally with respect to a direction of movement of the finger; and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps between respective image drive plates and said image pickup plate (Fig. 1, elements 9, paragraph 0040, lines 14-16 and paragraph 0043, lines 5-9).

Borza, Tschudi & Puttkammer are combinable because they are from the same art of image sensing through the use of capacitance.

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At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide the image sensor disclosed by the combination Borza and Tschudi with the image pickup plate and drive plates as taught by Puttkammer.

The suggestion/motivation for doing so would have been to provide a single image pickup plate with reduced capacitive coupling between electrodes (Puttkammer, paragraph 0024, lines 1-9)..

Therefore, it would have been obvious to combine Borza and Tschudi with Puttkammer to obtain the invention as specified in claim 80.

As to claim 81, please refer to the rejection of claim 69 above.

15. Claim 87 is rejected under 35 U.S.C. 103(a) as being unpatentable over Puttkammer and Raynal in view of Borza and Tschudi.

As to claim 87, please refer to the rejection of claims 84 and 79 above.

### ***Conclusion***

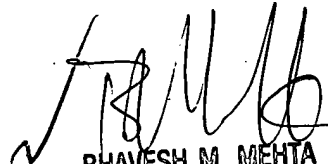
16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W. Carter whose telephone number is (571) 272-7445. The examiner can normally be reached on 8am - 4:30 am (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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